

IN THE CLAIMS:

Please cancel Claims 32, 34, 37, and 39 without prejudice to or disclaimer of the recited subject matter.

Please amend Claims 1, 10, and 31 as follows.

1. (Currently Amended) An image processing apparatus for generating an image of a virtual space according to a user's operation using ray space data comprising:

    a recording unit adapted to record the ray space data;

    an inputting unit adapted to input a user's operation of movement in the virtual space;

    a setting unit adapted to set a sampling rate for the ray space data read out from said recording unit according to the user's operation, the sampling rate indicating a distance between pixels to be sampled;

    a reconstructing unit adapted to read out ray space data from said recording unit according to the sampling rate set by said setting unit, and to reconstruct an image of the virtual space, the read out ray space data being arranged on a line in the ray space, and being on the line at an interval in accordance with the sampling rate; and

    an interpolation unit adapted to interpolate pixels of the image reconstructed by said reconstructing unit until the size of the image becomes a predetermined size,

wherein the ray space data is managed in a (x,u) space, wherein "x" represents a position where the light ray intersects the X-axis and "u" represents a tangent of an angle the light ray makes with the Z-axis, and

the ray space data read out by said reconstructing unit is data discretely sampled on a line in a ray space according to the sampling rate set by said setting unit.

2. (Cancelled)

3. (Previously Presented) The apparatus according to claim 1, wherein the setting unit determines the sampling rate on the basis of the moving speed in a virtual space designated by the user.

4. (Previously Presented) The apparatus according to claim 1, wherein the setting unit determines the sampling rate on the basis of the manipulation speed of an object in a virtual space designated by the user.

5. - 9. (Cancelled)

10. (Currently Amended) An image processing method for reconstructing an image of a virtual space according to a user's operation using ray space data recorded in a recording means, comprising:

an inputting step of inputting a user's operation of movement in the virtual space;

a setting step of setting a sampling rate for the ray space data read out from the recording means according to the user's operation, the sampling rate indicating a distance between pixels to be sampled;

a reconstruction step of reading out ray space data from the recording means in accordance with the sampling rate set in said setting step, and reconstructing an image of the virtual space, the read out ray space data being arranged on a line in the ray space, and being on the line at an interval in accordance with the sampling rate; and

an interpolation step of interpolating pixels of the image reconstructed by said reconstruction step until the size of the image becomes a predetermined size,

wherein the ray space data is managed in a (x,u) space, wherein “x” represents a position where the light ray intersects the X-axis and “u” represents a tangent of an angle the light ray makes with the Z-axis, and

the ray space data read out by said reconstruction step is data discretely sampled on a line in a ray space according to the sampling rate set by said setting step.

11. - 30. (Cancelled)

31. (Currently Amended) A computer-readable storage medium for storing a program which makes a computer function as an image processing apparatus for generating an image virtual space according to a user's operation using ray space data recorded in a memory, the program comprising:

an inputting step of inputting a user's operation of movement in the virtual space;

a setting step of setting a sampling rate for ray the space data read out from the memory according to the user's operation, the sampling rate indicating a distance between pixels to be sampled;

a reconstructing step of reading out ray space data from the memory according to the sampling rate set in said setting step, and reconstructing an image of the virtual space, the read out ray space data being arranged on a line in the ray space, and being on the line at an interval in accordance with the sampling rate; and

an interpolation step of interpolating pixels of the image reconstructed in said reconstructing step until the size of the image becomes a predetermined size,

wherein the ray space data is managed in a (x,u) space, wherein “x” represents a position where the light ray intersects the X-axis and “u” represents a tangent of an angle the light ray makes with the Z-axis, and

the ray space data read out by said reconstruction step is data discretely sampled on a line in a ray space according to the sampling rate set by said setting step.

32. (Cancelled)

33. (Previously Presented) An image processing apparatus for generating an image of a virtual space according to a user's operation using ray space data comprising:

a recording unit adapted to record the ray space data;

a setting unit adapted to set a sampling rate for ray space data read out from said recording unit according to the user's operation, the sampling rate indicating a distance between pixels to be sampled;

a reconstructing unit adapted to read out ray space data from said recording unit according to the sampling rate set by said setting unit, and to reconstruct an image of the virtual space; and

an interpolation unit adapted to interpolate pixels of the image reconstructed by said reconstructing unit until the size of the image becomes a predetermined size,

wherein ray space data is managed in a (x,u) space, wherein “x” represents a position where the light ray intersects the X-axis and “u” represents a tangent of an angle the light ray makes with the Z-axis, and

wherein a quantization of the position x is done using the minimum spacing between two neighboring light rays on the x-axis, a quantization of u is done using the tangent of an angle between two neighboring pixels and a camera view point position.

34. (Cancelled)

35. (Previously Presented) The method according to claim 10, wherein the setting step determines the sampling rate on the basis of the moving speed in a virtual space designated by the user.

36. (Previously Presented) The method according to claim 10, wherein the setting step determines the sampling rate on the basis of the manipulation speed of an object in a virtual space designated by the user.

37. (Cancelled)

38. (Previously Presented) An image processing method for reconstructing an image of a virtual space according to a user's operation using ray space data recorded in a recording means, comprising:

a setting step of setting a sampling rate for ray space data read out from the recording means according to the user's operation, the sampling rate indicating a distance between pixels to be sampled;

a reconstruction step of reading out ray space data from the recording means in accordance with the sampling rate set in said setting step, and reconstructing an image of the virtual space; and

an interpolation step of interpolating pixels of the image reconstructed by said reconstruction step until the size of the image becomes a predetermined size,

wherein ray space data is managed in a (x,u) space, wherein "x" represents a position where the light ray intersects the X-axis and "u" represents a tangent of an angle the light ray makes with the Z-axis, and

wherein a quantization of the position x is done using the minimum spacing between two neighboring light rays on the x-axis, a quantization of u is done using the tangent of an angle between two neighboring pixels and the camera view point position.

39. (Cancelled)